
Space Weather Forecast

Issued on Tuesday, 06 June 2023 at 13:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate flares (R1/Minor-R2/Moderate radio blackouts). Slight chance of a G1/Minor Geomagnetic Storm 07/08 June.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low. There are ten sunspot regions on the visible disc, however, only two, both in the southern hemisphere possess sufficient complexity for significant flares. A new region appears to be rotating over the southeast limb at present at around S23 latitude, although is too foreshortened in available imagery to make a confident assessment at this time.

No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery during the period.

Solar Wind / Geomagnetic Activity: Solar winds have shown evidence of some slight disturbance, thought to be linked to the passing of one or more weak CMEs. Wind speeds were initially slightly elevated, around 410 km/s, decreasing to ~350km/s around 06/0000 UTC before increasing to become slightly elevated again with speeds of 420km/s at the end of the period. The total magnetic field was initially at moderate levels, but has erratically declined to become weak. The important north-south component, Bz, was largely weakly positive, with a few generally short-lived periods of negative Bz. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain generally Low but there is a chance of Moderate activity, and a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: A filament lift-off starting around 04/0900UTC from the southwest produced a Coronal Mass Ejection (CME). A glancing blow at Earth is possible, although not guaranteed, either late Day 2 or more likely into Day 3 (07-08 June). Generally solar winds expected to remain at slightly elevated or slow-ambient levels. Perhaps seeing a slight enhancement Day 2-3 should Earth experience any CME effects.

Geomagnetic activity is forecast to be mainly Quiet to Unsettled (Kp0-3) with a slight chance of Active (Kp4) intervals on Day 1 (06 June), should we continue to see any weak CME enhancements. Activity possibly increasing late Day 2 into Day 3 (07-08 June) should we see any CME effects, becoming more Unsettled with a chance of Active intervals and a slight chance of isolated G1/Minor Geomagnetic Storm intervals (Kp5).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels with solar radiation storms unlikely to occur. However, there is a very slight chance of reaching the S1/Minor Storm threshold should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	15	20	10
Strong	G3	No	1	1	2	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)